What is claimed is:

1. A method of calibrating a QKD system having a first QKD station (Bob) with a first modulator (MB), a second QKD station (Alice) with a second modulator (MA), comprising:

a) operating the QKD system with a first modulator basis voltage $V_B(1)$ and varying the basis voltage V_A of the second modulator to establish a first basis voltage $V_A(1)$ for the second modulator that yields constructive interference of detected quantum pulses;

b) operating the QKD system while varying the basis voltage V_A of the second modulator to establish a second basis voltage $V_A(2)$ for the second modulator that yields destructive interference of detected quantum pulses;

c) operating the QKD system with a second modulator basis voltage $V_B(2)$ and varying the basis voltage V_A of the second modulator to establish a third basis voltage $V_A(3)$ for the second modulator that yields constructive interference of detected quantum pulses; and

d) operating the QKD system while varying the basis voltage of the second modulator to establish a fourth basis voltage $V_A(4)$ for the second modulator that yields destructive interference of detected quantum pulses.

2. The method of claim 1, including:

e) operating the QKD system with basis voltages that would be expected to yield a 50:50 photon count probability between each of two single-photon detectors;

f) measuring the photons count probability using the single-photon detectors; and

g) if the measured photon count probability in f) is not 50:50, varying at least one of the basis voltages $V_B(1)$ and $V_B(2)$ and repeating acts a) through f) until the photon counts probability becomes 50:50.

3. A method according to claim 1, including:

during operation of the QKD system, measuring photon counts in respective first and second single-photon detectors to establish the basis voltages $V_A(1)$, $V_A(2)$, $V_A(3)$ and $V_A(4)$ that yield a minimum photon count in either of the first and second detectors.

4. A method of calibrating a QKD system having first and second operably coupled QKD stations Bob and Alice with respective first and second modulators MB and MA driven by respective voltages V_B and V_A, comprising:

a) exchanging photons between the QKD stations while fixing voltage V_B to a first value $V_B(1)$ and varying the second voltage V_A to determine basis voltages $V_A(1)$ and $V_A(2)$ that correspond to a either a minimum or maximum photon count;

b) exchanging photons between the QKD stations while fixing the first basis voltage V_B to a second value $V_B(2)$ and varying the second basis voltage V_A to determine basis voltages $V_A(3)$ and $V_A(4)$ that correspond to a either a minimum or maximum photon count; and

c) operating the QKD system with intentionally selected incorrect basis voltages V_B and V_A and measuring a probability distribution of detecting constructive versus destructive interference between photons modulated by modulators MA and MB to ensure orthogonality of the basis voltages.

5. The method of claim 4, wherein adjusting the basis voltages in act c) includes repeating acts a) through c) with one or more different first basis voltage values V_B if the measured probability distribution is different than 50:50, so as to establish basis voltages V_A and V_B that yield the 50:50 probability distribution.

6. The method of claim 4, including operating the QKD system with the calibrated basis voltage values $V_B(1)$, $V_B(2)$, $V_A(1)$, $V_A(2)$, $V_A(3)$ and $V_A(4)$.

7. The method of claim 4, including programming a controller operably coupled to i) modulator drivers (44,14) that are operably coupled to respective modulators MB and MA, and ii) to first and second single-photon detectors, to carry out acts a) through d).

8. A method of calibrating two modulators MA and MB in a QKD system, comprising:

a) operating the QKD system with a first fixed modulation voltage $V_B(1)$for modulator MB and varying a modulation voltage V_A of the second modulator to establish first and second basis voltages $V_A(1)$ and $V_A(2)$ for the second modulator based on measuring photon counts in one or more single-photon detectors; and

b) operating the QKD system with a second fixed modulation voltage $V_B(2)$ for modulator MB and varying the modulation voltage V_A of the second modulator to establish third and fourth basis voltages $V_A(3)$ and $V_A(4)$ for the second modulator based on measuring photon counts in the one or more single-photon detectors.

9. The method of claim 8, including:

measuring an orthogonality of the modulation voltages.

10. The method of claim 9, including adjusting at least one of the basis voltages so that the basis voltages are orthogonal if the measurement of claim 9 reveals that the modulation voltages are not orthogonal.

11. The method of claim 8, including measuring an orthogonality of the modulation voltages by:

c) setting the modulation voltages to values expected to yield a 50:50 photon count probability distribution between constructively and destructively interfered photons;

d) measuring the photon count probability distribution; and

e) if the photon count probability distribution is other than 50:50, adjusting at least one of the basis voltages for modulator MB and repeating acts a) through d) to achieve a 50:50 photon count probability distribution.

12. The method of claim 8, including operating the QKD system with the calibrated basis voltage values $V_B(1)$, $V_B(2)$, $V_A(1)$, $V_A(2)$, $V_A(3)$ and $V_A(4)$.